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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY.'S DOCKET: TANGA2

In re Application of:)	Art Unit: 1655
Michifumi TANGA, et al.)	Examiner: B.J. FORMAN
Serial No.: 09/601,875)	Confirmation No. 5274
Filed: October 12, 2000)	Washington D.C.
For: SUBSTRATES AND CHIPS)	August 20, 2002
FOR IMMOBILIZING AND)	
AMPLIFYING DATA)	

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AMENDMENT

Honorable Commissioner for Patents
Washington, D.C. 20231

In response to the Office Action of
March 29, 2002, for which a two month extension of time to
respond, please enter the following amendment:

IN THE CLAIMS

Cancel claim 3 without prejudice or disclaimer.

Please amend claim 1 as follows:

1. (Third Amendment) Solid state substrate adapted
and configured for DNA immobilization, said solid state
substrate having a thermal conductivity ratio of at least
0.1W/cmEK for amplifying and immobilizing DNA,

wherein the surface of the substrate is modified by
binding a chloride or a hydroxyl radical to the substrate, and

wherein the surface of the solid state
substrate is roughened.

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Please amend claim 4 as follows:

F₂ 4. (Third Amendment) The substrate as claimed in claim 1, wherein said substrate has a polar radical at a terminal on the surface of the substrate.

[Please amend claim 13 as follows:]

F₃ 13. (Twice Amended) A solid state substrate having DNA immobilized thereon, wherein said substrate is diamond or diamond like carbon and is chemically modified by binding a chloride or a hydroxyl radical to the substrate, and the substrate has a roughened surface.

REMARKS

Claims 1-2, 4-16 and 22-38 currently appear in this application. Claims 12 and 26-38 are the subject of a restriction requirement which has been made final, and have not been examined. The Office Action of March 29, 2002, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicants respectfully request favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Specification

The substitute specification filed October 9, 2001, has not been entered because it is said not to conform to 37 CFR 1.125 (b).

Art Rejections

Claims 1-5, 9-11, 13-16, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Chrissey et al. as defined by Sumiya et al.

This rejection is respectfully traversed. The claims have been amended to recite that the surface of the substrate is roughened, and that the surface is chemically modified by binding a chloride or a hydroxyl radical to the surface of the substrate. Support for these amendments can be found in the specification as filed at page 5, lines 17-25 and page 7, lines 6-20.

As demonstrated in the amendment filed September 5, 2001, there is nothing in Chrisey that discloses or suggests a roughened surface or chemical modification using a hydroxyl or a chloride binding reaction. The substrates of Chrisey are modified by electrodeposition and UV crosslinking, and require the presence of a silane coupling agent to bind a nucleic acid onto the substrate.

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobashi as defined by Sumiya et al.

This rejection is respectfully traversed. As noted above, the claims have been amended to recite that the substrate is adapted and configured for DNA immobilization, and that the surface has been modified by binding a chloride or a hydroxyl radical to the substrate and the surface of the substrate has been roughened. Kobashi discloses a biosensor in which an identifying substance is affixed to the surface thereof. In Kobashi there is no DNA attached to the substrate.

Claims 6-8 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chrisey et al. in view of Kobashi.

This rejection is respectfully traversed. While both Chrisey et al. and Kobashi teach diamond substrates, it should be noted that Chrisey et al. is concerned with attaching a pattern of nucleic acid molecules to a substrate, while Kobashi is concerned with identifying biological or chemical substances comprising a transducer having a

bioidentifier affixed thereto. There is nothing in Kobashi about binding nucleic acids to the substrate, and therefore there would be no motivation to use the Kobashi chemical modification to produce the substrate of Chrisey et al for attaching a pattern of nucleic acids.

Claims 6-10 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobashi in view of Chrisey et al.

This rejection is respectfully traversed. As noted above, Kobashi is concerned with fixing substances such as enzymes and microorganisms onto a diamond transducer. Chrisey et al. are concerned with forming patterns of nucleic acids on substrates. These are quite different substances, and it is respectfully submitted that there is no motivation for one skilled in the art to use a technique for affixing enzymes and microorganisms (which are substantially proteins) for affixing nucleic acids to a substrate.

As the Federal Circuit stated in *In re Lee*, 61 USPQ2d 1430 (January 18, 2002, Fed. Cir.), "As applied to the determination of patentability *vel non*, when the issue is obviousness, 'it is fundamental that rejections under 35 U.S.C. 103 must be based on evidence comprehended by the language of that section.' *In re Grasselli*, 53 USPQ2d 1769, 1774 (Fed. Cir. 2000)... When patentability turns on the question of obviousness, the search for an analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and

combine the references relied on as evidence of obviousness
See, e.g., McGinley v. Franklin Sports, Inc., 60 USPQ2d 1001,
1008 (Fed. Cir. 2001) ('the central question is whether there
is a reason to combine [the] references,' a question of fact
drawing on the *Graham* factors."

'The factual inquiry whether to combine references
must be thorough and searching.' *Id.* This precedent has been
reinforced in myriad decisions, and cannot be dispensed with,
See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris,
Inc., 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). ('a showing of a
suggestion, teaching, or motivation to combine the prior art
references is an "essential component of an obviousness
holding"'') (quoting *C. R. Bard, Inc. v. M3 Systems, Inc.* 48
USPQ2d (Fed. Cir. 1998)) The Court went on to quote *In re*
Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999), "Our case
law makes clear that the best defense against the subtle but
powerful attraction of a hindsight-based obviousness analysis
is rigorous application of the requirement for a showing of
the teaching or motivation to combine prior art references."

There is a requirement for specificity in combining
references, *See, In re Kotzab*, 55 USPQ2d 13134, 1317 (Fed.
Cir. 2002) ("particular findings must be made as to the reason
the skilled artisan, with no knowledge of the claimed
invention, would have selected these components for
combination in the manner claimed.").

In the present case, the Examiner has shown no
motivation to combine *Chrissey et al.* and *Kobashi* to arrive at

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the particular substrate adapted and configured for DNA
immobilization as claimed herein.

In view of the above, it is respectfully submitted
that the claims are now in condition for allowance, and
favorable action thereon is earnestly solicited.

Respectfully submitted,

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